AMENDMENTS TO THE CLAIMS

1.-5. (Cancelled)

6. (Currently Amended) A linear detector array system for use in a target inspection system for detecting a contents of the target, the linear detector array comprising:

a plurality of vertical rows of staggered photon detectors, each of the plurality of vertical rows being vertically staggered from each other vertical row, such that a pitch between any two closest adjacent staggered photon detectors is smaller than a diameter of the staggered photon detectors; and

a counter comprising an amplifier, a discriminator, and a pulse generator for each photon detector and means for discretely counting photons received by each photon detector, wherein at least some of the photons received by each photon detector passed through the contents of the target.

7. (Currently Amended) The linear detector array system of Claim 6 further comprising:

a center vertical row of staggered detectors and one or more side vertical rows of staggered photon detectors:

a processor comprising an image-generating program, the processor receiving photon counting data from each of the one or more side vertical rows and from the center vertical row;

the image-generating program further including:

adjustment means for determining an adjustment for a horizontal displacement k of the one or more side vertical rows from the center vertical row, wherein the adjustment is used to correlate the photon counting data from the side vertical rows with photon counting data from the center vertical row so as to form undistorted images for multiple planes within the target.

8. (Original) The linear detector array system of Claim 7 wherein the adjustment means further includes:

computing means for determining an image adjustment distance 1 for multiple planes within the target according to a relationship 1=kZ/D, wherein Z is variable and is a distance between a radiation source and each of the multiple planes

within the target, and wherein D is a distance between the radiation source and the linear detector array.

9. (Currently Amended) A method for processing staggered detection data for use in a target inspection system, the method comprising the steps of:

providing a plurality of vertical rows of staggered <u>photon</u> detectors, each of the plurality of vertical rows being vertically staggered from each other vertical row, such that a pitch between any two closest adjacent staggered <u>photon</u> detectors is smaller than a diameter of the staggered <u>photon</u> detectors including:

providing a center vertical row of staggered <u>photon</u> detectors;

providing one or more side vertical rows of staggered <u>photon</u> detectors;

<u>discretely counting photons received by each photon detector, wherein at least some of the photons received by each photon detector passed through the target;</u>

~~providing a processor comprising an image-generating program;~~

receiving <u>photon counting</u> data at ~~the~~ <u>a</u> processor <u>comprising an image-generating program</u> from each of the one or more side vertical rows and from the center vertical row;

determining an adjustment for a horizontal displacement k of the one or more side vertical rows in order to correlate the <u>photon counting</u> data from the side vertical rows with <u>photon counting</u> data from the center vertical row so as to form undistorted images for multiple planes within the target.

10. (Original) The method of Claim 9 wherein the step of determining an adjustment for a horizontal displacement k further includes:

determining an image adjustment distance 1 for multiple planes within the target according to a relationship 1=kZ/D, wherein Z is variable and is a distance between a radiation source and each of the multiple planes within the target, and wherein D is a distance between the radiation source and the linear detector array.

11. (Currently Amended) The method of Claim 10, further comprising:

adjusting the <u>photon counting</u> data from the one or more side vertical rows and the center vertical row using the adjustment distance l for each of the multiple planes to form undistorted images for each of the multiple rows; and

comparing the undistorted images for each of the multiple planes to determine the location of an object within the target.

12. (New)   A linear detector array system for use in a target inspection system for detecting a contents of the target, the linear detector array comprising:

a plurality of vertical rows of staggered detectors including a center vertical row of staggered detectors and one or more side vertical rows of staggered detectors, each of the plurality of vertical rows being vertically staggered from each other vertical row, such that a pitch between any two closest adjacent staggered detectors is smaller than a diameter of the staggered detectors;

a processor comprising an image-generating program, the processor receiving data from each of the one or more side vertical rows and from the center vertical row;

the image-generating program further including:

adjustment means for determining an adjustment for a horizontal displacement k of the one or more side vertical rows from the center vertical row, wherein the adjustment is used to correlate the data from the side vertical rows with data from the center vertical row so as to form undistorted images for multiple planes within the target; and

computing means for determining an image adjustment distance l for multiple planes within the target according to a relationship $l=kZ/D$, wherein Z is variable and is a distance between a radiation source and each of the multiple planes within the target, and wherein D is a distance between the radiation source and the linear detector array.

13. (NEW) A method for processing staggered detection data for use in a target inspection system, the method comprising the steps of:

providing a plurality of vertical rows of staggered detectors, each of the plurality of vertical rows being vertically staggered from each other vertical row, such that a pitch between any two closest adjacent staggered detectors is smaller than a diameter of the staggered detectors including:

providing a center vertical row of staggered detectors;

providing one or more side vertical rows of staggered detectors;

providing a processor comprising an image-generating program;

receiving data at the processor from each of the one or more side vertical rows and from the center vertical row;

determining an adjustment for a horizontal displacement k of the one or more side vertical rows in order to correlate the data from the side vertical rows with data from the center vertical row so as to form undistorted images for multiple planes within the target; and

determining an image adjustment distance 1 for multiple planes within the target according to a relationship 1=kZ/D, wherein Z is variable and is a distance between a radiation source and each of the multiple planes within the target, and wherein D is a distance between the radiation source and the linear detector array.

14. (NEW)   The method of Claim 13, further comprising:

adjusting the data from the one or more side vertical rows and the center vertical row using the adjustment distance 1 for each of the multiple planes to form undistorted images for each of the multiple rows; and

comparing the undistorted images for each of the multiple planes to determine the location of an object within the target.